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15 inches in length, including stipe. Regarding the locality, he further says: "The Cincinnati Southern R. R. crosses the Cumberland River in Pulaski Co., $\frac{1}{2}$ a mile down from the bridge, where there is a cascade falling over sub-carboniferous rocks. Within, around, and beneath the fall is the *Adiantum* growing in great profusion."

I intend visiting the locality in about two or three weeks and will then write full particulars.

JOHN WILLIAMSON.

Louisville, Ky.

§ 59. **A Large Chestnut Tree.**—A fine specimen of *Castanea vesca*, L., var. *Americana*, Michx., stands in the township of New Barbadoes, Bergen County, N. J., half way between River Edge and New Milford stations on the N. J. and N. Y. R. R. about one hundred feet east of the railroad. The circumference at six feet from the ground is eighteen feet, which is slightly increased up to the first ramification at the estimated height of twenty-five feet. The very spreading and declining branches, themselves as large as ordinary trees, cover a space of ground not less than seventy-five feet in diameter. The tree is perfectly sound.

W. H. RUDKIN.

§ 60. **On the Northward Extension of the N. J. Pine Barren Flora on Long and Staten Islands.**—The famous Pine Barren region of N. J. extends with few interruptions all the way from the Lower Bay of New York to Cape May and the mouth of the Delaware River. It occupies a narrow belt, near the Atlantic coast with its northern portion, but expands as it extends southward so as to include nearly the whole of Southern New Jersey. The Flora of this section of North America has long been widely known to include some of the rarest and most beautiful plants to be found on our continent, and has, therefore, been thoroughly explored by botanists from all sections of the country.

The soil of this region, as all who have travelled through it will bear witness, is generally extremely sandy, but is occasionally more firm, in places where strata of clay approach and form the surface.

The ages of the geological formations which occupy this territory are, Tertiary in the portion lying to the south and south-east of a line drawn from a point on the Atlantic coast a few miles south of Long Branch, to another near the head of Delaware Bay; and Cretaceous, north of this line, and extending between it, and the southern edge of the Triassic formation, which follows a line from the centre of Staten Island to the vicinity of Trenton.

As the soil over both the Cretaceous and Tertiary is composed of similar materials, it is impossible to say, from surface indications just where one ends and the other begins.

The Tertiary pine barrens extend southward along the Atlantic coast to Florida; it is with the Flora of the northern extension of these sandy stretches, of *Cretaceous* age, with which we have to do at present. On Staten Island these strata are exposed in its extreme southern portion, occupying an area of perhaps one-fifteenth of the county; they doubtless extend over the entire southern and eastern

sections, but are there mostly covered by a layer of material of variable thickness derived from the Glacial Drift. In places this layer is very thin, and sandy soil appears. On Long Island the terminal moraine of the glacier occupies a position marked by a range of hills extending throughout its whole length, at an average distance of ten miles from the Atlantic. South of these hills, which have been appropriately called the backbone of the island, sandy plains prevail, the material composing them having been formed partly from the modified drift of the hills and partly from the underlying Cretaceous strata. In Suffolk County these plains occupy a considerable surface, and their flora has been very thoroughly worked up by our fellow member, Mr. E. S. Miller. The object of this paper is to call special attention to the number of characteristic plants of the New Jersey pine barrens which have already been detected in Staten and Long Islands, and which are recorded in the pamphlets, "The Flora of Suffolk County," and "The Flora of Richmond County," and their addenda.

First we will consider those species hitherto detected on the Cretaceous soils of Staten Island, and not found on the Drift; there are 34 of these plants, and they are as follows:—*Magnolia glauca*, L.; *Hudsonia ericoides*, L.; *Ascyrum Crux-Andree*, L.; *Arcnaria squarrosa*, Michx.; *Polygala lutea*, L.; *Tephrosia Virginiana*, Pers.; *Desmodium laevigatum*, DC.; *Desmodium viridiflorum*, Beck.; *Rubus cuneifolius*, Pursh.; *Crataegus parvifolia*, Ait.; *Eupatorium rotundifolium*, L.; *Aster nemoralis*, Ait.; *Aster concolor*, L.; *Chrysopsis Mariana*, Nutt.; *Gnaphalium purpureum*, L.; *Gaylussacia dumosa*, T. & G.; *Andromeda Mariana*, L.; *Kalmia angustifolia*, L.; *Ipomoea pandurata*, Meyer; *Phlox subulata*, L.; *Asclepias obtusifolia*, Michx.; *Euphorbia Ipecacuanhae*, L.; *Quercus nigra*, L.; *Quercus prinoides*, Will.; *Quercus Phellos*, L.; *Spiranthes simplex*, Gray.; *Juncus scirpoides*, Lam., var. *macrostemon*; *Xyris flexuosa*, Muhl., Chap.; *Cyperus cylindricus*, N. L. B.; *Stipa avenacea*, L.; *Glyceria obtusa*, Trin.; *Panicum verrucosum*, Muhl.; *Andropogon macrourus*, Michx.; *Lycopodium inundatum*, L., var. *Bigelovii*, Tuck.

Of these the following four have not been detected in Suffolk County:—*Desmodium viridiflorum*, Beck.; *Rubus cuneifolius*, Pursh.; *Ipomoea pandurata*, Meyer; *Phlox subulata*, L.

In addition to the above list, however, the following sixteen additional species have been detected in Suffolk County:—*Drosera filiformis*, Raf.; *Ascyrum stans*, Michx.; *Eupatorium hyssopifolium*, L.; *Eupatorium leucolepis*, T. & G.; *Eupatorium album*, L.; *Aster specabilis*, Ait.; *Solidago puberula*, Nutt.; *Chrysopsis falcata*, Ell.; *Helianthus angustifolius*, L.; *Coreopsis rosea*, Nutt.; *Utricularia subulata*, Le Conte.; *Cupressus thyoides*, L.; *Juncus pelocarpus*, E. Meyer; *Xyris Caroliniana*, Walt.; *Eleocharis melanocarpa*, Torr.; *Sporobolus serotinus*, Gray.

Thus it appears that 34 of these characteristic pine barren plants grow in the southern part of S. I., and that 46 of them have been detected in Suffolk Co., L. I. I have no doubt that these lists will be augmented by future explorations.

As we proceed eastward from L. I., we find that there are a few of these same plants growing on soil of Tertiary age in the southern parts of the Eastern States; and it would seem that these species have a tendency to follow the course of the two more recent geological formations, throughout their whole extent along the Atlantic coast. Another fact which stands out prominently in this connection, is that not a single one of the above-mentioned plants, growing, as we have seen, just along the edge of the mantle of Glacial Drift is native of Europe; that is, they belong to a true American flora, which had its origin in the southern part of the continent. In contrast to which fact, we have another one, equally prominent, and that is, that of the species of plants growing on the material brought down by the ice sheet, about one-third are common to northern Europe and America, thus pointing to a common origin of each in the territory now occupied by the ice and snow of the Arctic regions.

N. L. BRITTON.

§ 61. **Teratology.**—*Lilium candidum* often has the uppermost flower 5-merous; all that I have noticed this year were so. I have seen 6-merous *Sarracenia purpurea*, and 4-merous *Tigridia*—the large cultivated species, (*Pavonia*?).
D. C. E.

§ 62. **Botanical News.**—Trimen's *Journal of Botany* for June contains:—A Review of the British Characeae (2 plates), continued, by H. and J. Groves; Remarks on Botanical Nomenclature, by B. Daydon Jackson; Botany of the British Polar Expedition of 1876-7, by H. C. Hart; Wilhelm Philip Schimper, by W. Carruthers.

The *Botanical Gazette* for June contains the following notes:—Vitality of the Seeds of Serotinous Cones, and *Fraxinus quadrangulata* hermaphrodite, by G. Englemann; *Notulae exiguae*, by A. Gray; *Platanthera bracteata*, and Double *Thalictrum anemonoides*, by T. Meehan; *Cobaea scandens* proterandrous, by W. W. Bailey; Notes on certain Silkweeds, by Edward L. Greene; Notes from Florida, by A. H. Curtiss; A Natural Botanic Garden, by J. M. Coulter; Some Plants of Franklin County, Ky., by R. H. Wildberger; and Notes from Illinois, by H. L. Boltwood.

The *Gardeners' Chronicle* states that at the meeting of the Linnean Society on June 3, a paper was read by Mr. George Murray "On the Application of the Results of Pringsheim's Recent Researches on Chlorophyll to the Life of the Lichen." Summarizing the results of Pringsheim's labours, the author considered the suggestion of Dr. Vines that, by the aid of an artificial chlorophyll screen, the protoplasm of fungi might be excited to the decomposition of carbonic acid, and contended that this proposed experiment is proceeding naturally in lichens. He pointed out that in these organisms we have the fungal tissues in the body of the thallus, and the chlorophyll screen in the gonidia; and that light traversing the chlorophyll-containing gonidia—often occurring as a dense layer—excites in the fungal tissues the decomposition of carbonic acid. In evidence he adduced the plentiful occurrence in the fungal hyphae of starch, or rather lichenin—a substance of the same chemical composition as starch $C_{12}H_{10}O_{10}$.